

## **REMARKS**

Entry of the amendments to the claims and the following remarks are respectfully requested.

### ***Claim Amendments***

Claims 1-30 were pending in the application. Please cancel claims 14-16 without prejudice. By this paper, claims 1-13 and 17-30 remain pending. Reconsideration of the rejections are respectfully solicited in view of the following remarks.

### ***Claim Rejections – 35 USC §112***

Claims 6 and 16 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully notes that claim 16 has been canceled without prejudice. Examiner states that these claims use the phrases “bias module,” “scalar bias value,” and “maximum weight,” but are not described in the specification. Applicant respectfully refers Examiner to the response (filed July 20, 2006) to the April 18, 2006 Office Action, where the applicant submitted amendments to paragraphs 44 and 57 of the specification in accordance with instructions from the Examiner to amend the specification to describe the phrases above. Accordingly, proper support for the terms “bias module” and “scalar bias value” in claim 6 is provided. Withdrawal of the rejection to claim 6 is respectfully requested.

### ***Claim Rejections – 35 U.S.C. §102***

Claims 14 and 15 have been rejected under 35 U.S.C. §102(b) as being anticipated by *Adaptive nonlinear neural network controller for rotorcraft vibration* by Spencer et al., 1997, SPIE Vol 3041, 538-553, (hereinafter referred to as Spencer). Applicant respectfully notes that claims 14-16 have been canceled without prejudice.

***Claim Rejections – 35 U.S.C. §103(a)***

Claims 1, 2, 5, 21, 22, 28, and 30 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Spencer, in view of *Small Business Innovation Research to Support Aging Aircraft, Priority Technical Areas and Process Improvements*, published by the National Academy of Sciences, Publication NMAB-497 (hereinafter referred to as NMAB-497).

Reconsideration of the rejection of claims 1, 2, 5, 21, 22, 28, and 30 under 35 U.S.C. §103(a) as being unpatentable over Spencer in view of NMAB-497 is respectfully requested. Applicant respectfully submits that there is no incentive, suggestion, or motivation to combine the rotor blade vibration control system disclosed in Spencer with the NMAB-497 reference, which discusses cracks and corrosion in aircraft.

Regarding independent claim 1, there is no motivation to combine the rotor blade vibration control system disclosed in Spencer with the teachings regarding cracks and corrosion in aircraft disclosed in NMAB-497. Spencer discloses a rotor blade vibration control system. NMAB-497 discusses the causes of cracks and corrosion in aircraft and the detection of cracks and corrosion in aircraft. There is no teaching, suggestion, or motivation in Spencer that the rotor blade vibration control system could or should be combined with teachings regarding cracks and corrosion in aircraft in NMAB-497.

Further, even if a combination of Spencer and NMAB-497 were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of claim 1. Spencer admittedly does not teach or suggest at least “input parameters relating to a repair of the structure.” Likewise, NMAB-497 does not teach or suggest at least “input parameters relating to a repair of the structure.”

In the Office Action, Examiner states that “input parameters relating to a repair of the structure” of claim 1 is equivalent to “evaluation guidelines for the lives of bolted repairs” in NMAB-497, p42:31. However, a close reading of NMAB-497 shows that the referred to “evaluation guidelines for the lives of bolted repairs” is merely a recommended area of emphasis for future R&D programs (*See* NMAB-497, p.42:26-28). In addition, NMAB-497 does not suggest that such “evaluation guidelines” can be received at an “input module” coupled to “a neural network.” Undisclosed and possibly unknown “evaluation guidelines” to be prepared in the future certainly are not equivalent to “input parameters relating to a repair of the structure” that are received at an “input module” coupled to “a neural network.” In fact, NMAB-497 does not suggest that “a neural network” should or could be used in the referred to “evaluation guidelines” or that the “evaluation guidelines” should or could include “aeroelastic analysis.” Moreover, the reference to “neural networks” in NMAB-497 is made in a different section than where the “evaluation guidelines” are referenced and neither have to do with “aeroelastic analysis.” Accordingly, NMAB-497 does not teach or suggest input parameters relating to a repair of a structure for receipt at an input module coupled to a neural network module to produce an aeroelastic analysis result. No combination of Spencer and NMAB-497 could result in the system of claim 1.

Also, Examiner states that “aeroelastic analysis” of claim 1 is equivalent to “nondestructive evaluation methods” of NMAB-497, p37:title. However, nowhere in NMAB-497 are the two equated. Applicant could not find any mention of “aeroelastic analysis” in the section titled “Nondestructive Evaluation Methods” in NMAB-497.

Therefore, even if a combination of Spencer and NMAB-497 were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 1. As a result, claim 1 is allowable over Spencer in view of

NMAB-497. Claims 2 and 5 which depend from allowable independent claim 1 are therefore also allowable.

Regarding independent claim 21, applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Further, even if a combination of Spencer and NMAB-497 were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of claim 21. Spencer admittedly does not teach or suggest at least “receiving at least one input parameter related to a repair of an aircraft structure.” Likewise, NMAB-497 does not teach or suggest “receiving at least one input parameter related to a repair of an aircraft structure.”

Examiner states that “receiving at least one input parameter related to a repair of an aircraft structure” of claim 21 is equivalent to “evaluation guidelines for the lives of bolted repairs” in NMAB-497, p42:31. However, a close reading of NMAB-497 shows that the referred to “evaluation guidelines for the lives of bolted repairs” is merely a recommended area of emphasis for future R&D programs (*See* NMAB-497, p.42:26-28). In addition, NMAB-497 does not suggest that such “evaluation guidelines” can be applied to “a predetermined neural network transfer function . . . to generate an aeroelastic analysis result.” Undisclosed and possibly unknown “evaluation guidelines” to be prepared in the future certainly are not equivalent to “receiving at least one input parameter related to a repair of an aircraft structure” that is applied to “a predetermined neural network transfer function . . . to generate an aeroelastic analysis result.” In fact, NMAB-497 does not suggest that “a neural network” should or could be used in the referred to “evaluation guidelines” or that the “evaluation guidelines” should or could include “aeroelastic analysis.” The reference to “neural networks” in NMAB-497 is made in a different section than where the “evaluation guidelines” are referenced and neither have to do with “aeroelastic analysis.”

Therefore, even if a combination of Spencer and NMAB-497 were made, which applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 21. As a result, claim 21 is allowable over Spencer in view of NMAB-497. Claim 22 which depends from allowable independent claim 21 is therefore also allowable.

Regarding independent claim 28, applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Further, even if a combination of Spencer and NMAB-497 were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of claim 28. As noted above, Spencer and NMAB-497 do not teach or suggest at least “receiving at least one input parameter related to a repair of an aircraft structure.”

Examiner states that “receiving at least one input parameter related to a repair of an aircraft structure” of claim 28 is equivalent to “evaluation guidelines for the lives of bolted repairs” in NMAB-497, p42:31. However, a close reading of NMAB-497 shows that the referred to “evaluation guidelines for the lives of bolted repairs” is merely a recommended area of emphasis for future R&D programs (*See* NMAB-497, p.42:26-28). In addition, NMAB-497 does not suggest that such that “evaluation guidelines” can be applied to “a predetermined neural network transfer function . . . to generate an aeroelastic analysis result.” As discussed above, “evaluation guidelines” to be prepared in the future certainly are not equivalent to “receiving at least one input parameter related to a repair of an aircraft structure” that is applied to “a predetermined neural network transfer function . . . to generate an aeroelastic analysis result.” In fact, NMAB-497 does not suggest that “a neural network” should or could be used with the referred to “evaluation guidelines” or that the “evaluation guidelines” should or could include “aeroelastic analysis.” The reference to “neural networks” in NMAB-497 does not relate to the

“evaluation guidelines” discussion in NMAB-497 and neither have to do with “aeroelastic analysis.”

Therefore, even if a combination of Spencer and NMAB-497 were made, which applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 28. As a result, claim 28 is allowable over Spencer in view of NMAB-497.

Regarding independent claim 30, applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Further, even if a combination of Spencer and NMAB-497 were made, which Applicant does not concede is proper, the purported combination still would not disclose all of the elements of claim 30. Spencer admittedly does not teach or suggest at least “means for receiving input parameters relating to a repair of an aircraft structure.” Likewise, NMAB-497 does not teach or suggest at least “means for receiving input parameters relating to a repair of an aircraft structure.”

Examiner states that “means for receiving input parameters relating to a repair of an aircraft structure” of claim 30 is equivalent to “evaluation guidelines for the lives of bolted repairs” in NMAB-497, p42:31. However, a close reading of NMAB-497 shows that the referred to “evaluation guidelines for the lives of bolted repairs” is merely a recommended area of emphasis for future R&D programs (*See* NMAB-497, p.42:26-28). In addition, NMAB-497 does not suggest that such that “evaluation guidelines” can be applied to “a neural network transfer function . . . to generate an aeroelastic analysis result.” Undisclosed and possibly unknown “evaluation guidelines” to be prepared in the future certainly are not equivalent to “receiving input parameters relating to a repair of an aircraft structure” that is applied to “a neural network transfer function . . . to generate an aeroelastic analysis result.” In fact, NMAB-497 does not suggest that “a neural network” should or could be used with the referred to “evaluation guidelines” or that the “evaluation guidelines” should or could include “aeroelastic

analysis.” The reference to “neural networks” in NMAB-497 is made in a different section than where the “evaluation guidelines” are referenced and neither have to do with “aeroelastic analysis.”

Therefore, even if a combination of Spencer and NMAB-497 were made, which applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 30. As a result, claim 30 is allowable over Spencer in view of NMAB-497.

Claims 3 and 4 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Spencer and NMAB-497, in view of United States Patent Application Publication No. US 2003/0191406 A1 to Russell C. Eberhart et al., (hereinafter referred to as Eberhart). Reconsideration of the rejection of claims 3 and 4 under 35 U.S.C. §103(a) as being unpatentable over Spencer and NMAB-497 in view of Eberhart is respectfully requested.

Regarding dependent claims 3 and 4, applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Claims 3 and 4 which depend from allowable independent claim 1 are therefore also allowable.

Claims 6-10, 13, 16-20, 23, 25, 27, and 29 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Spencer and NMAB-497, in view of PhD dissertation *Aeroelasticity of Morphing Wings Using Neural Networks* of Anand Natarajan, 2002, (hereinafter referred to as Natarajan). Claim 16 has been canceled without prejudice. Reconsideration of the rejection of claims 6-10, 13, 15, 17-20, 23, 25, 27, and 29 under 35 U.S.C. §103(a) as being unpatentable over Spencer and NMAB-497 in view of Natarajan is respectfully requested.

Regarding dependent claims 6-10 and 13, applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Claims 6-10 and 13 depend from allowable independent claim 1 are therefore also allowable.

Regarding independent claim 17, applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Further, even if a combination of Spencer, NMAB-497, and Natarajan were made, which applicant does not concede is proper, the purported combination still would not disclose all of the elements of claim 17. Admittedly, neither Spencer nor Natarajan teach or suggest at least “determining input parameters relating to one or more repairs performed on a structure.” Likewise, NMAB-497 does not teach or suggest at least “determining input parameters relating to one or more repairs performed on a structure.”

Examiner states that “determining input parameters relating to one or more repairs performed on a structure” of claim 17 is equivalent to “evaluation guidelines for the lives of bolted repairs” in NMAB-497, p.42:31. However, a close reading of NMAB-497 shows that the referred to “evaluation guidelines for the lives of bolted repairs” is merely a recommended area of emphasis for future R&D programs (*See* NMAB-497, p.42:26-28). In addition, NMAB-497 does not suggest that such that “evaluation guidelines” can be used with “a neural network” or “a trained neural network” to determine “aeroelastic characteristics of the structure based in part on the trained neural network.” Undisclosed and possibly unknown “evaluation guidelines” to be prepared in the future certainly are not equivalent to “determining input parameters relating to one or more repairs performed on a structure” and using “a neural network” and “a trained neural network” to determine “aeroelastic characteristics of the structure based in part on the trained neural network.” In fact, NMAB-497 does not suggest that “a neural network” should or could be used with the referred to “evaluation guidelines” or that the “evaluation guidelines” should or could include “aeroelastic analysis.” The reference to “neural networks” in NMAB-497 does not relate to the “evaluation guidelines” discussion in NMAB-497 and neither have to do with “aeroelastic analysis.”



Therefore, even if a combination of Spencer, NMAB-497, and Natarajan were made, which applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 17. As a result, claim 17 is allowable over Spencer and NMAB-497, in view of Natarajan. Claims 18-20 depend from allowable independent claim 17 and are therefore also allowable.

Regarding dependent claims 23, 25, and 27, applicant respectfully reiterates the remarks set forth above regarding independent claim 21. Claims 23, 25, and 27 depend from allowable independent claim 21 and therefore are also allowable.

Regarding independent claim 29, applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Further, even if a combination of Spencer, NMAB-497, and Natarajan were made, which applicant does not concede is proper, the purported combination still would not disclose all of the elements of claim 29. Admittedly, neither Spencer nor Natarajan teach or suggest at least “receiving a mass input related to a repair.” Likewise, NMAB-497 does not teach or suggest at least “receiving a mass input related to a repair.”

Examiner states that “receiving a mass input related to a repair” of claim 29 is illustrated by “fatigue, corrosion, and foreign object impact” in NMAB-497, p42:3-14. However, a close reading of NMAB-497 shows that the referred to “fatigue, corrosion, and foreign object impact” relate to “damage,” NMAB-497, p42:7, not inputs and certainly not inputs related to a repair. In addition, NMAB-497 does not suggest that such that “fatigue, corrosion, and foreign object impact” can be applied in “a neuron transfer function to . . . generate an aeroelastic analysis flutter result.” Examiner fails to explain how “fatigue, corrosion, and foreign object impact” can illustrate “a mass input related to a repair” that is applied in “a neuron transfer function to . . .

generate an aeroelastic analysis flutter result.” In fact, NMAB-497 does not even disclose either “a neuron transfer function” nor “an aeroelastic analysis flutter result.”

Therefore, even if a combination of Spencer, NMAB-497, and Natarajan were made, which applicant does not concede is proper, the purported combination still would not disclose all of the elements of independent claim 29. As a result, claim 29 is allowable over Spencer and NMAB-497 in view of Natarajan.

Claims 11 and 24 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Spencer and NMAB-497, in view of United States Patent No. 5,784,739 to Kawada et al., (hereinafter referred to as Kawada). Reconsideration of the rejection of claims 11 and 24 under 35 U.S.C. §103(a) as being unpatentable over Spencer and NMAB-497 in view of Kawada is respectfully requested.

Regarding dependent claim 11, applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Claim 11 depends from allowable independent claim 1 and is therefore also allowable.

Regarding dependant claim 24, applicant respectfully reiterates the remarks set forth above regarding independent claim 21. Claim 24 depends from allowable independent claim 21 and is therefore also allowable.

Claims 12 and 26 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Spencer and NMAB-497, in view of United States Patent No. 6,189,830 to Schnetz et al., (hereinafter referred to as Schnetz). Reconsideration of the rejection of claims 12 and 26 under 35 U.S.C. §103(a) as being unpatentable over Spencer and NMAB-497 in view of Schetz is respectfully requested.

Regarding dependent claim 12, applicant respectfully reiterates the remarks set forth above regarding independent claim 1. Claim 12 depends from allowable independent claim 1 and is therefore also allowable.

Regarding dependant claim 26, applicant respectfully reiterates the remarks set forth above regarding independent claim 21. Claim 26 depends from allowable independent claim 21 and is therefore also allowable.

### ***Conclusion***

In view of the aforesaid, reconsideration and allowance of all claims at issue are respectfully solicited.

Respectfully submitted,

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